

AMENDMENT UNDER 37 C.F.R. § 1.111
U.S. APPLICATION NO. 09/856,362
ATTORNEY DOCKET NO. Q64544

AMENDMENTS TO THE DRAWINGS

The Patent Office objects to the Drawings under 37 C.F.R. 1.83(a). In response, Applicant has added new Fig. 3f to show the attenuator. No new matter has been added.

The Patent Office objects to the Drawings under 37 C.F.R. 1.83(b). To correct the alleged deficiency, applicant submits herewith an amended version of the original Fig. 3 labeled as a “replacement sheet,” and copies of Figs. 3b-3e properly labeled as “new sheet.” All applicable rules are believed complied with.

Attachment: One (1) replacement sheet and five (5) new drawing sheets

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REMARKS

Claims 1-8 and 10-25 are all the claims presently pending in the application.

1. Applicant has amended the “Brief Description of the Drawings” section of the specification as the Examiner suggested.
2. Claims 24 and 25 stand rejected under 35 U.S.C. § 112 (1st para.) as allegedly failing to comply with the enablement requirement. Applicant traverses the § 112 (1st para.) rejection of claims 24 and 25 for at least the following reasons.

With regard first to claim 24, it is noted that there is no “means” recited in that claim, but it simply (and accurately) refers to the compensation provided by the optical fiber, which is exactly what the examiner describes in the Office action as being disclosed in the application. So the inclusion of this claim in the rejection is not understood. This is not a “single means” claim because there is no means plus function language at all.

In addition, a skilled artisan would appreciate that the optical fiber could have more than one function. For example, in Saleh (U.S. Patent No. 6,587,241) cited by the Patent Office, an amplifying fiber 32 can serve multiple purposes in the optical system, such as performing dispersion compensation and providing different levels of amplification of the signal wavelengths (Saleh, col. 6, lines 58-61).

Further, as shown in Fig. 1 of the present application, the spectrum distribution over the very broad band has three zones. In the first zone, the channels are subjected to depletion by the

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Raman effect. In the second zone, the signals of the channels are enriched by energy transferred by the Raman effect from the preceding channels, and are also depleted by energy transfer by the Raman effect towards the following zones. In the third zone, the channels are enriched by energy transferred by the Raman effect from the preceding channels. A solution to compensate the enrichment in the third zone is using the increasing linear losses of the transmission fiber (Specification, the paragraph bridging pages 9 and 10). With the teaching of the specification, a skilled artisan would know how to make or use the invention. Thus, the invention of claim 24 is described in a way as to enable one skilled in the art.

The Patent Office has asserted that if the only item claimed is the fiber, which is the compensation means of claim 25, there is only a single means claimed. Applicant respectfully disagrees. Claim 25 is a dependent claim of claim 19, which is a dependent claim of claim 11. The broadband optical amplification system recited in claim 19 comprises optical media and compensation means. Thus, claim 19 is not a single means claim.

Claim 11 could have been drafted to say that the optical fiber includes compensation means, but instead refers to the system as including compensation means. Either is perfectly accurate and consistent with the specification. A suitable dependent claim from claim 11 could state that the compensation means is in the optical fiber, but if such a claim were added, it would not then render claim 11 ambiguous because it is broad enough to cover the inclusion of compensation means within the fiber and the inclusion of compensation means as separate attenuators (which is described in the specification as an alternative embodiment). With the teaching of the specification, a skilled artisan would know how to make or use the invention

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recited in claim 25. Thus, the invention recited claim 25 is described in a way as to enable one skilled in the art to make and use the invention.

Based on the foregoing reasons, Applicant respectfully requests that the Patent Office reconsider and withdraw the § 112 (1st para.) rejection of claims 24 and 25.

3. Claims 1-6, 11-18, 21 and 22 stand rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Saleh (U.S. Patent No.6,587,241). Applicant traverses the § 103(a) rejection of claims 1-6, 11-18, 21 and 22 for at least the following reasons.

Saleh discloses, *inter alia*, optical protection methods, systems and apparatus. According to Saleh, it is not uncommon for failures to occur in links along a transmission path, and at least one redundant path is provided between the origin and the destination nodes. As a result, when a failure occurs, the information is switched from a working path to a protection path. Saleh's purpose is to provide effective protection with increasing wavelength efficiencies for use in long distance communication systems.

As shown in Fig. 1 of Saleh, optical amplifiers 12 provide partitioned optical signal amplification in a plurality of wavelength groups λ_G . The gain provided to signal wavelengths λ_i by the amplifier 12 is partitioned by wavelength groups λ_G . Consequently, if an amplifier power supply fails for one wavelength group, the remaining amplifier power supplies continue to function and provide optical amplification for the remaining, or surviving, wavelength groups (Saleh, col. 6, lines 7-13).

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Thus, Saleh focuses on the redundant path between the origin and destination nodes.

Saleh does not mention at all the energy transfer between channels caused by the Raman effect over the very broad band. Therefore, Saleh is non-analogous art.

The Patent Office has acknowledged that Saleh does not teach or suggest the causes of the attenuation. However, the Patent Office argues that the Raman effect is caused by using wavelengths in the very broad wavelengths together, and by partitioning wavelengths into bands in order to compensate them, it would have been obvious to compensate for Raman effect. Applicant respectfully disagrees, because Saleh teaches providing optical amplification for surviving wavelength groups when one wavelength group failed. Saleh does not differentiate whether the failed wavelength group is at the beginning of a band, in the middle of the band, or at the end of the band. Saleh does not realize the special characteristic of energy transfers between channels caused by the Raman effect over the very broad band, it is not possible for Saleh to compensate for, theoretically or practically, the energy transfer caused by the Raman effect. There is no mention anywhere in Saleh of the concept of energy transfers between channels caused by the Raman effect, so there is nothing to suggest taking this into account when designing any other part of the system. So even *if* the hardware in Saleh were capable of being used in such a way as to satisfy the present claims, there would have been nothing to suggest this and therefore no basis for an obviousness rejection. Accordingly, the Patent Office's argument is not supported by Saleh.

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Based on the forgoing reasons, Applicant submits that claims 1-6, 11-18, 21 and 22 are allowable over Saleh. Applicant respectfully requests that the Patent Office reconsider and withdraw the § 103(a) rejection of claims 1-6, 11-18, 21 and 22.

6. Claims 7, 8, 10, 19, 20 and 23 stand rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Saleh in view of Chraplyvy (EP 0749224). Applicant respectfully traverses the § 103(a) rejection of claims 7, 10, 19, 20 and 23 for at least the reasons discussed below.

Chraplyvy is directed to a method for suppressing stimulated Raman scattering (SRS) crosstalk in WDM fiber systems by spectral shaping. According to Chraplyvy, depletion caused by SRS may become the dominant source of the signal to noise ratio (SNR) degradation, and the SNR degradation caused by SRS could be greatly reduced by spectral shaping of the spectrum made up of a WDM channel set, e.g., by shaping the amplifier gain to favor the higher frequency, SRS-depleted, channels (Chraplyvy, col. 4, lines 7-18). Chraplyvy does not mention the Raman effect over the very broad band, which not only includes the depletion of signals over the lower wavelength channels of a band, but also the enrichment of signals over the higher wavelength channels of the band. Chraplyvy at most is similar to the French patent application No. 99/07324 discussed in the Background of the Invention section of the present application.

Given the different purposes of Saleh and Chraplyvy, there is no suggestion or motivation for a skilled artisan to combine the two references.

In addition, neither Saleh nor Chraplyvy found the characteristics of the Raman effect over the very broad, which includes: depletion of signals over the lower wavelength channels of a band, enrichment of signals over the higher wavelength channels of the band, and balance of

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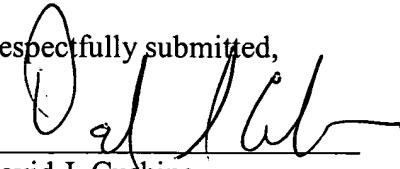
depletion and enrichment over the middle wavelength channels of the band. Thus, even if a skilled artisan were to combine the two references, the combination would not result in the claimed invention.

Furthermore, neither of the cited references talks about compensating enrichment of channels caused by Raman effect over the end of a very broad band.

Based on the forgoing reasons, Applicant submits that claims 7, 8, 10, 19, 20 and 23 are allowable over Saleh. Applicant respectfully requests that the Patent Office reconsider and withdraw the § 103(a) rejection of claims 7, 8, 10, 19, 20 and 23.

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

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Date: November 30, 2005